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CERTIFICATE

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Application Date:	May 12, 2003
Application No.:	03221812.5
Type of Application:	Utility Model
Title of Invented Creation:	Automatic Safe Self-destructive Disposable Blood Collection Needle
Applicant:	SHI Guo-Ping
Inventor or Designer:	SHI Guo-Ping

Chief, Intellectual Property Rights Bureau
Republic of China [illegible]

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CLAIMS

1. An automatic safe self-destructive disposable blood collection needle which includes: a case, a needle core or lancet [3] and a spring [4], wherein the case comprises a shoot chamber, in which a needle exiting hole [10] is established in the front end thereof, a lancet [3] is established in a sliding manner inside the shoot chamber, wherein a needle point [11] is established in the front part of thereof, the needle point [11] is located facing the needle exiting hole [10], the spring [4] is established in the trajectory direction at the back part of said lancet [3], a trajectory blocking structure is established on the compression path of said spring on a side of the lancet [3] and said case, characterized in that said trajectory blocking structure is constructed of an elastic arm push button [5] on said case and of an elastic arm [6] on lancet [3], said elastic arm push button [5] being a structure that projects on a side of the case, a locking hole [12] being established at its push button action end facing the side wall of the case, the spring* [6] being a structure that extends to a side of said lancet [3], its terminal being coordinated with the locking hole [12] in the lockdown state and a notch [7] or a shrink neck on which stress is readily concentrated being established at its base.

2. The blood collection needle as described in claim 1, further characterized in that the above-described notch [7] is established on the outer side of said spring* [6].

3. The blood collection needle as described in claim 1, further characterized in that said notch [7] on which stress is readily concentrated is a V-shaped notch.

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* sic; elastic arm?—Trans. Note.

4. The blood collection needle as described in claim 1, further characterized in that a space providing sufficient avoidance is established for the spring* [6] in the inward bending direction.

5. The blood collection needle as described in claim 1, further characterized in that an opening blocker [14] that is engaged with the side face of said locking hole [12] is established at the terminal of said spring* [6].

* sic; elastic arm?—Trans. Note.

SPECIFICATION

Automatic Safe Self-Destructive Disposable Blood Collection Needle

Field of Technology

This utility model relates to an automatic safe disposable blood collection needle, and, specifically, it relates to a structure that uses a self-destructive locking and shooting structure to realize a disposable safe-discharge automatic blood collection needle. The blood collection needle locking and shooting structure undergoes self-destruction during use and can not be reused.

Background Technology

There are many and diverse forms of blood collection needles for medical use. However, "mini type" blood collection needles, which have the characteristics of being safe and disposable, having a simple structure, being convenient to operate and of low cost, are a trend in future development. The large number of "mini type" blood collection needles that are on the market at present are of delicate structure and convenient to use and they are also disposable products. However, their structure can be reused. For this reason, this type of design, strictly speaking, is not safe. In order to overcome this defect and to thoroughly eliminate hidden dangers to safety, there was disclosed on April 2, 2003, Chinese Utility Model No. 02221043.1 entitled "Automatic Safe Destructive Disposable Blood Collection Needle." In the operation of the locking and shooting structure of this Utility Model, a force component in the side direction

produced by the contact between an inclined face on an obstructing piece and the elastic block is used, on the one hand, to cause the elastic block to become disconnected, and, on the other hand, to force the elastic block to undergo a destructive break at the opening at its base, with a one-time discharge being realized with the objective that it cannot be recovered. For this reason, the locking and shooting structure of this type of blood collection needle can only be used one time, with the possibility of reuse being completely eliminated so that a product that fully merits the name disposable is truly formed. In this present utility model, a disposable, safe automatic blood collection needle of another type of self-destructive locking and shooting structure was designed on the basis of the principle of "one-time discharge and not reusable." The locking and shooting structure of this blood collection needle undergoes self-destruction at the same time as discharge, for which reason it cannot be reused.

Content of the Invention

In order to achieve the object described above, the technical scheme used in this utility model is as follows: An automatic safe self-destructive disposable blood collection needle which includes: a case, a lancet and a spring, in which the case comprises a shoot chamber, a needle exiting hole is established in the front end of the shoot chamber, a lancet slide is established inside the shoot chamber, a needle point is established in the front part of the lancet, the needle point is located across from the needle exiting hole, the spring is established in the trajectory direction in the back part of the lancet, a trajectory blocking structure is established on the compression path of the spring on a side of the lancet and the case, characterized in that said trajectory blocking

structure is constructed of an elastic arm push button on the case and of the elastic arm on the lancet, the elastic arm push button being a structure that extends toward the side of the case, a locking hole being established at its push button action end facing the side wall of the case, the spring* being a structure that extends to the side of the lancet, its terminal being coordinated with the locking hole in the lockdown state, and a notch or a shrink neck on which stress is readily concentrated is established at its base.

The relevant content and changes of the technical scheme described above are as follows:

1. In the above-described scheme, the aforementioned "lancet" indicates the component that carries the body of the needle and is generally comprised of the needle body and a part that encloses the needle body. A needle cap can be installed anterior of the lancet to achieve the effect of protecting the needle point. One end of the needle cap is exposed outside the needle hole and the other end penetrates the needle hole and covers the needle point.

2. In the above-described scheme, the locking and shooting structure is generally installed on a side face of the blood collection needle. This side face and the sliding guide structures on both sides are staggered. That is to say, if sliding guidc grooves and sliding guide ribs are installed on both sides of the blood collection needle, then the locking and shooting structure is installed on another side face. For example, as shown in Figure 1, the locking and shooting structure is installed on the upper side face.

3. In the above-described scheme, the aforementioned "shrink neck" indicates that self-destruction of the elastic arm is realized during use by the shape of the structure, which undergoes cross-sectional contraction. In fact, this structure is related to a notch

* sic; elastic arm?—Trans. Note.

4. In the above-described scheme, the above-described notch can be established on either the inner side or the outer side of the elastic arm. However, there is a better effect when it is established on the outer side, thereby facilitating the development of stress concentration.

5. In the above-described scheme, in order to assure that the elastic arm readily breaks and undergoes self-destruction when push button pressure is applied, there is a better effect during stress concentration when the notch is designed as a V-shaped notch.

6. In the above-described scheme, a sufficient avoidance space should be established in the direction of inward bending of the elastic arm in order to ensure that self-destruction occurs when the elastic arm is bent.

7. In the above-described scheme, in order to effect a more secure locking of the terminal of the elastic arm and the inner side face of the locking hole, a specialized notch* can be established at the terminal of the elastic arm and it can be assured that the lancet is kept in a securely locked state by means of this notch*.

The principles of action of this utility model are as follows: Before use of the blood collection needle, the spring is in a contracted state, and the notch* at the terminal of the elastic arm on the lancet is blocked on the side face of the locking hole, causing the lancet to be in a state awaiting discharge, as may be seen by referring to appended Figure 1. When the elastic arm push-button is pushed down by a finger, the push-button pushes the elastic arm inwardly, causing the notch* and the locking hole to become disengaged. The spring pushes the lancet along the sliding guide structure and it shoots out, as may be seen by reference to Figure 2. Because a notch is established at the base, at the same time

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* sic; opening blocker? Given as "catching groove" in related US reference—Trans. Note.

that the elastic arm is bent inwards, it breaks and undergoes self-destruction due to stress concentration on the notch site, so that there is no way for it to recover to its original ejectable state, as may be seen by reference to Figure 3.

Because of the use of the technical scheme described above, this present scheme has the following technical advantages and effects by comparison with the prior art.

1. As a result of providing a notch or shrink neck structure of this utility model, on which stress is readily concentrated, the elastic arm is disengaged by push-button pressure, and, at the same time, undergoes breaking and self-destruction, thus achieving the effects that one-time discharge occurs and recovery is not possible. The structure of this present technical scheme is simple and elegant, is a marked technological advance and is not obvious but easily observable, fully realizing the inventiveness of the utility model.

2. This utility model is simple to use. During operation, all that is necessary is to align the blood collection needle with the blood collection site and push the push button. If a needle cap is installed, all that is necessary is to first rotate the needle cap and pull it off and then align the needle with the blood collection site and push the push-button.

3. After use of this utility model, the needle point automatically draws back into the case and cannot be exposed to the outside, thus ensuring safety after use of the blood collection needle.

4. This utility model is of a small volume, is light in weight, is of good technological characteristics, serial production results in a high acceptibility, costs are low and it thus belongs to the category of compact safe disposable automatic "mini-type" blood collection needle.

Explanation of Appended Figures

Figure 1 is a structural sectional view of a working example of this utility model, which figure shows the assembled structure in the state before use.

Figure 2 is a structural sectional view of a working example of this utility model, which figure shows the assembled structure in the state in which it has been discharged for blood collection.

Figure 3 is a structural sectional view of a working example of this utility model, which figure shows the assembled structure in the state after use.

In the figures described above, the reference numerals denote the following: 1. case; 2. end cap; 3. lancet; 4. spring; 5. elastic arm push-button; 6. elastic arm; 7. notch; 8. guide groove; 9. guide rib; 10. needle exiting hole; 11. needle point; 12. locking hole; 13. avoidance space; 14. opening blocker; 15. needle cap; 16. projection rib; 17. recess.

Embodiments

Below, a further description of this utility model will be described in conjunction with the appended figures and a working model.

Working model: By reference to appended Figures 1 to 3, there is provided a self-destructive disposable automatic safe blood collection needle and it is comprised of a case 1, an end cap 2, a lancet 3 and a spring 4. The end cover 2 covers the tail part of the case 1. Its lower side is connected to the case 1 by a hook and its upper side is inserted into the recess 17 of the case 1 by the projection rib 16 on the cap. In this way, the end cap can be excellently guided action before it is pressed tightly. The case 1 and the end

cap 2 form a housing for the blood collection needle. A shoot chamber is formed in the housing and there is a needle exiting hole 10 at the front end of the shoot chamber. The lancet 3 is installed inside the shoot chamber, and, as shown in Figure 3, the guide ribs 9 are established on the anterior and posterior* sides, and the guide ribs 9 and the guide grooves 8 on the opposite sides of the shoot chamber are engaged to form a shoot guide structure. The lancet 3 is formed of a needle body that is coated with plastic. The needle point 11 is on the front part of the lancet 3, the needle point 11 is aligned opposite the needle exiting hole 10, the needle point 11 is covered by the needle cap 15 and a head portion of the needle cap 15 is exposed outside the needle exiting hole 10. The spring 4 is installed in the trajectory direction at the back of the lancet 3. One end of the spring is affixed in the tail part of the lancet 3 and the other end is affixed to the end cap 2. A locking and shooting structure is installed along the spring compression pathway on the lancet 3 and the case 1. This locking and shooting structure is comprised of an elastic push-button arm 5 on the housing and an elastic arm 6 on the lancet 3. The elastic arm push-button 5 is an extending elastic structure on the upper side of the end cap 2 and the site of its push-button action faces a locking hole 12 which is installed on a side wall of the case 1. The elastic arm 6 is an extending elastic structure of thc upper side of the lancet 3. The opening blocker 14 is installed. An inclined face is used for this opening blocker 14, and, in the locked state, it is fitted into the side wall of the locking hole 12. The lancet 3 and the spring 4 are held in a compressed state awaiting discharge. A notch 7, on which stress is readily concentrated, is installed at the base of the elastic arm 6. The notch 7 is a V-shaped notch. It is established on the outside of the elastic arm 6 and a sufficient avoidance space 13 is established in the direction of bending when the elastic

* given as "outer and inner sides" in the related US reference—Trans. Note.

arm 6 is bent inwardly. When the elastic arm push-button 5 is pushed, the elastic arm 6 is bent inwards toward the lancet 3. In the process of bending, one face of the elastic arm 6 causes the opening blocker 14 of the terminal and the locking hole 12 to become disengaged and enter into the shooting state, while the other face, and the other end face*, because stress is concentrated at the notch 7, causes the elastic arm 6 to break and undergo self-destruction. Finally, it causes the blood collection needle to lose its effect after a single discharging.

The working example described above serves only to illustrate the framework and characteristics of this utility model. Its object is to make it possible for those skilled in the art to understand the content of this utility model and provide a basis of its execution and cannot limit the scope of protection of this utility model. All equivalent changes and modifications made on the basis of the spirit and essence of this utility model should be included within the scope of protection of this utility model.

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* sic; Trans. Note.

Appended Figures of the Specification

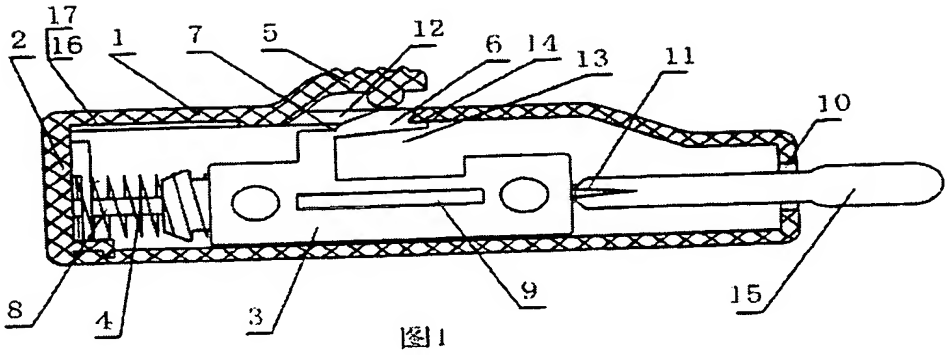

图1

Figure 1

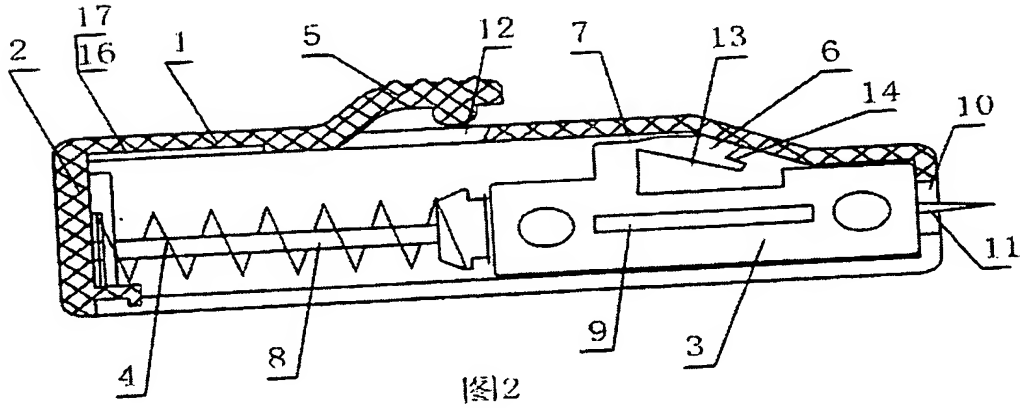

图2

Figure 2

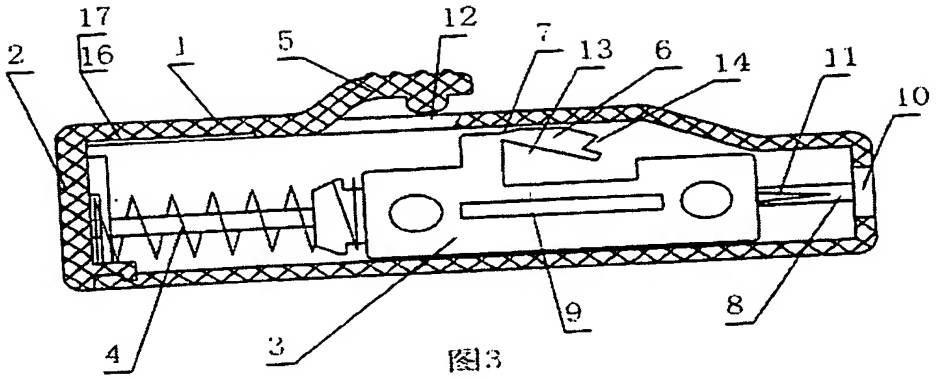

图3

Figure 3